AMENDMENTS TO THE CLAIMS

1. (currently amended) A quality control method for achieving complete deprotection of protected reactive groups in on-chip synthesis of a biopolymer array, the method comprising

(a) synthesizing a plurality of biopolymer species on an array from monomeric or oligomeric nucleotide building blocks comprising detectable protecting groups coupled directly to amino groups of the nucleotide building blocks, wherein the detectable protecting groups remain coupled until synthesis of the biopolymer array is complete,

(b) taking one or more steps to cleave the detectable protecting groups,

(c) determining a degree of deprotection by detecting any of the detectable protecting groups remaining on the array after cleavage, and

(d) repeating steps (b) and (c) until the detectable protecting groups are no longer detected, indicating that complete deprotection is achieved,

wherein the quality control method is performed entirely on-chip and wherein the synthesized biopolymer ~~species are not consumed or eliminated~~ are not destroyed by practice of the quality control method.

2. (original) The method of claim 1, wherein the detectable protecting groups are fluorescent groups.

3. (previously presented) The method of claim 2, wherein the fluorescent groups are selected from the group consisting of compounds comprising pyrene, dansyl, stilbene, rhodamine, and coumarin.

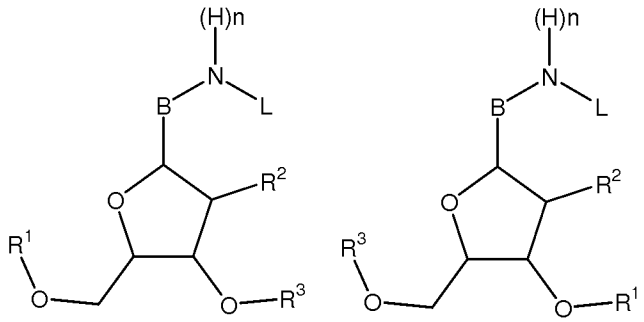
4-11 canceled)

12. (canceled)

13. (previously presented) The method of claim 1, wherein the biopolymer species are selected from the group consisting of nucleic acids and nucleic acid analogs.

14. canceled)

15. (previously presented) The method of claim 1, wherein the building blocks for the iopolymer synthesis are monomeric nucleotide building blocks having the general structural formulae (I) or (II):



I II

wherein R^1 is an hydroxy protecting group,
R^2 is -H, -(C_1-C_{10})-alkoxy, -(C_2-C_{10})-alkenyloxy, -(C_2-C_{10})-alkynyloxy, -halogen,
-azido, -NHR^7, -SR^7 or -OR^7, wherein R^7 is a protecting group or a reporter group,
R^3 is a phosphate, an H-phosphonate or other phosphate analog group which may contain a protecting group,
B is a nucleobase or a nucleobase analog,
n is 0 or 1, and
L is a detectable protecting group.

16. (original) The method of claim 15, wherein R^1 is selected from the group consisting of substituted triphenylmethyl groups, pixyl groups, photocleavable groups, and substituted silyl protecting groups.

17. (original) The method of claim 15, wherein R^1 is selected from the group consisting of 4,4'-dimethoxy triphenylmethyl compounds, 4-monomethoxy triphenyl compounds, p-nitrophenylpropoxy carbonyl (NPPOC), (α-methyl)-6-nitropiperonyloxy carbonyl (MeNPOC), *tert*-butyldimethyl silyl (TBDMS), and *tert*-butyldiphenyl silyl (TBDPS).

18. (original) The method of claim 15, wherein R^3 is a phosphite amide group.

19. (previously presented) The method of claim 18 wherein R^3 is -$P(R^6)$-NR^4R^5 wherein R^4 and R^5 are independently selected from the group consisting of -H, -(C_1-C_{10})-alkyl, -(C_2-C_{10})-alkenyl, and -(C_6-C_{22})-aryl, and R^6 is selected from the group consisting of H, -(C_2-C_6)-alkenyloxy, -(C_2-C_6)-alkenyl, -(C_1-C_6)-alkyl, and -(C_1-C_6)-alkoxy, wherein each group contains a substituent selected from the group consisting of -halo, p-nitroaryloxy, and -cyano.

20. (original) The method of claim 19, wherein R^6 is a 2-cyanoethyloxy group.

21. (original) The method of claim 15 wherein L has the structure -C(O)-R when n=1, or =CH-NR^8R when n=0, wherein R is a residue of the protecting group and R^8 is selected from the group consisting of H and -(C_1-C_3)-alkyl.

22. (previously presented) The method of claim 15, wherein B is selected from the group consisting of adenine (A), guanine (G), cytosine (C), aza analogs of A, G, and C, deaza analogs of A, G, and C, combination aza and deaza analogs of A, G, and C and analogs thereof containing additional amino groups.

23-26 (canceled)